

RAIL ROADS IN ENGLAND BALTIMORE, 1829





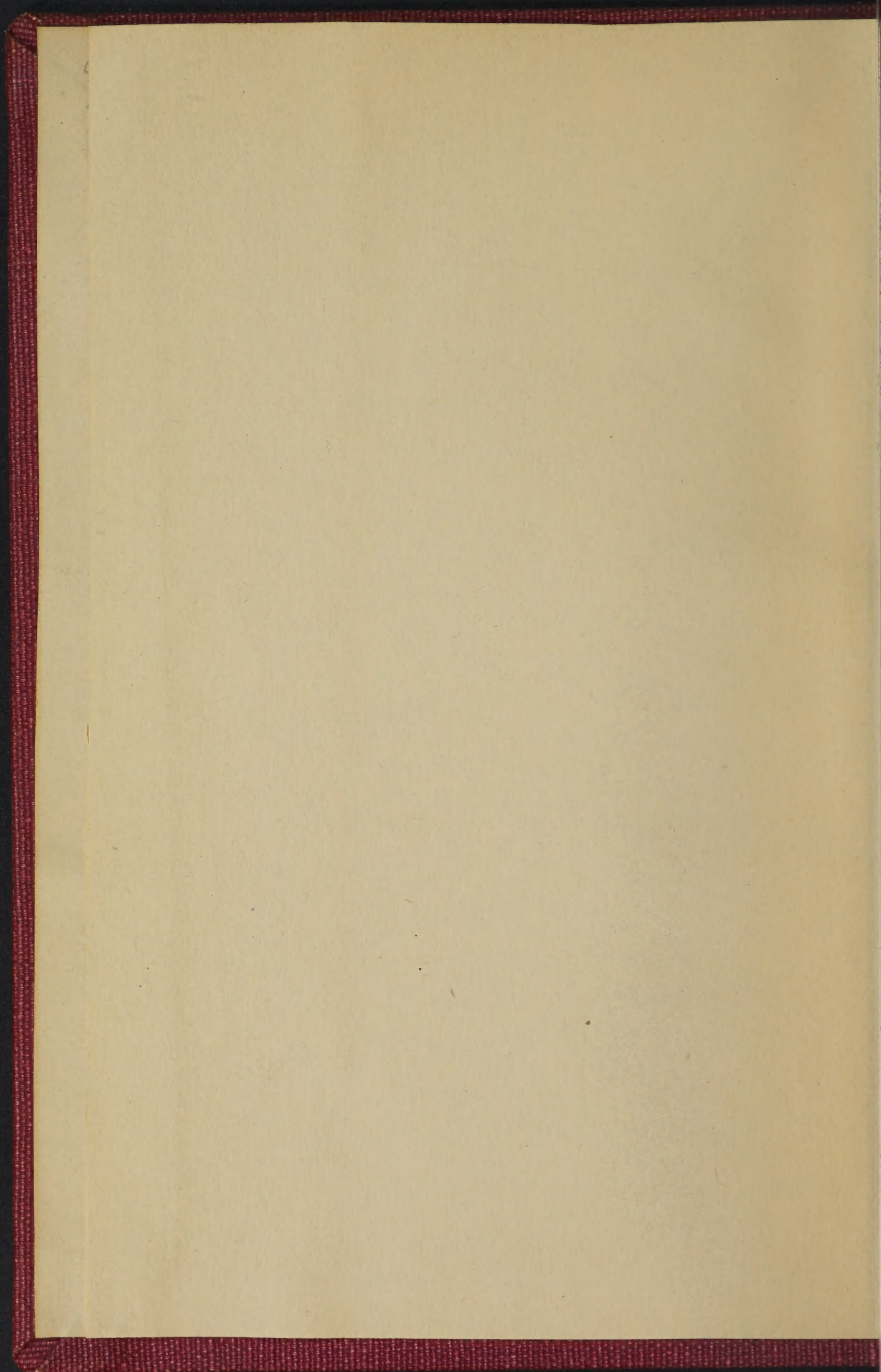


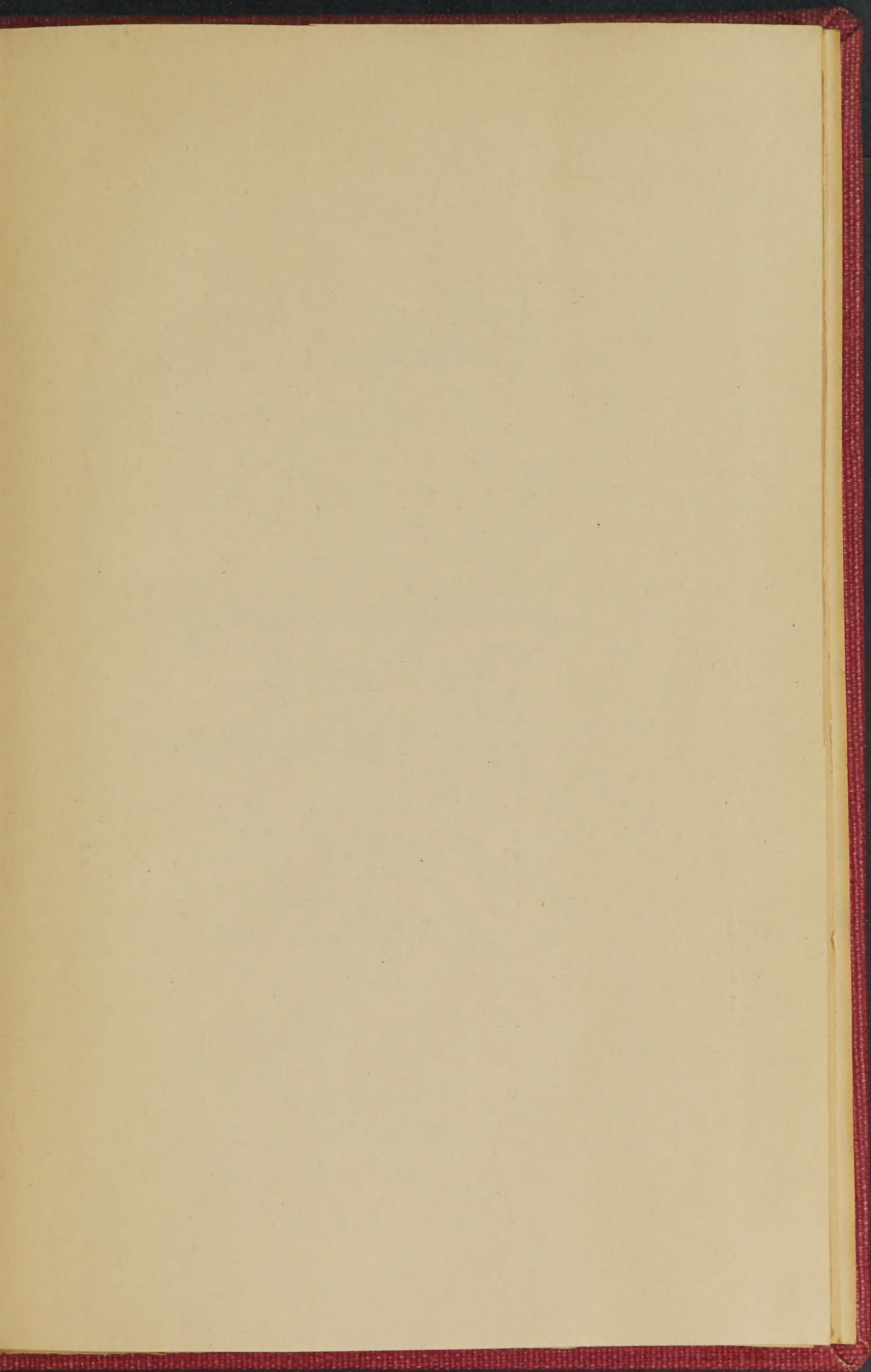
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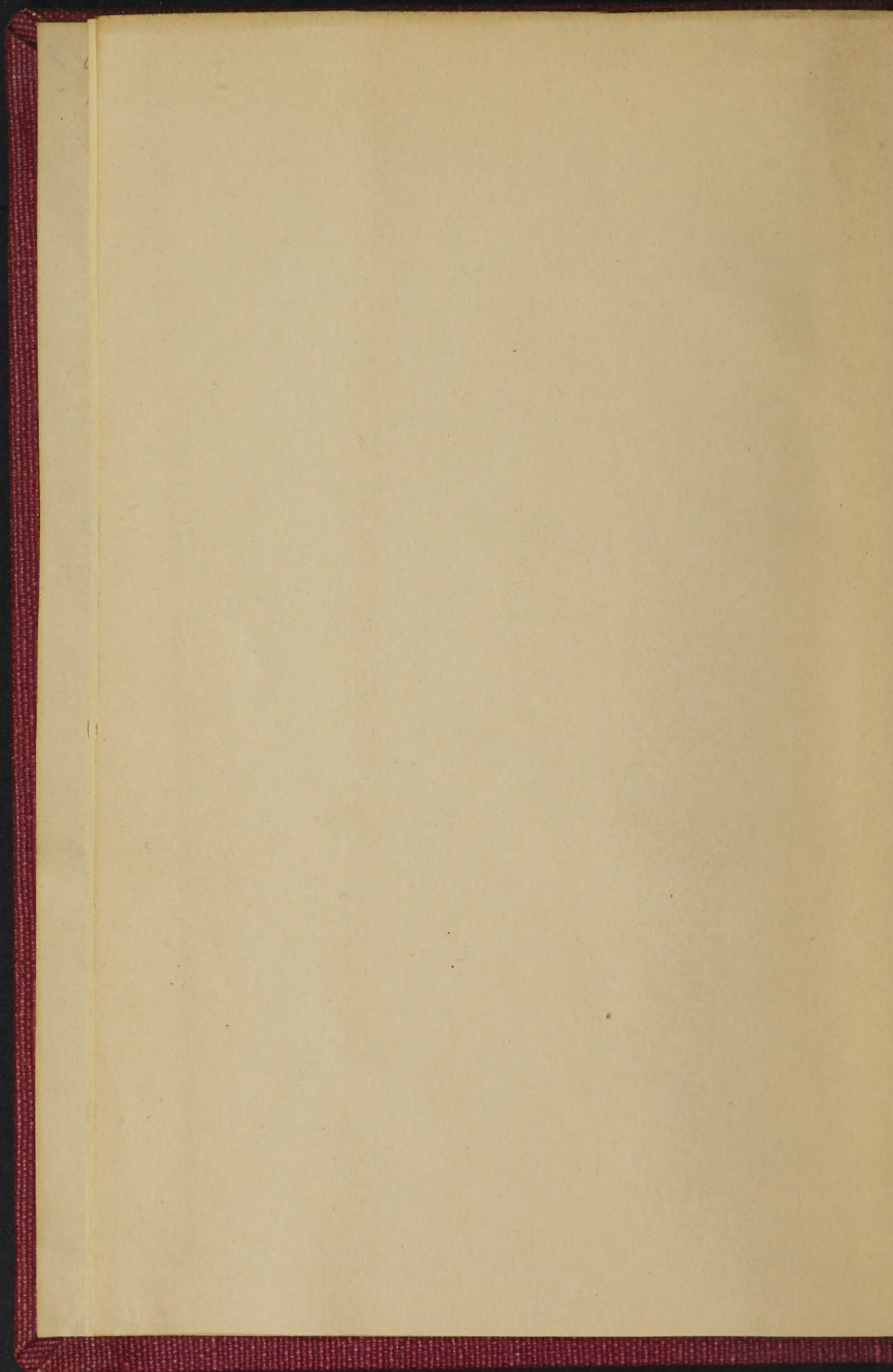
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EXPERIMENTS
ON
RAIL ROADS,
IN ENGLAND,
ILLUSTRATIVE
OF THE
Safety, Economy and Speed,
OF
TRANSPORTATION,
WHICH THIS SYSTEM,
AS NOW IMPROVED,
IS CAPABLE OF AFFORDING.

Baltimore:

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1829.

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EXPERIMENTS
ON
RAIL ROADS.

The importance of securing an easy, economical, and expeditious means of communication, between all parts of our widely extended country, now rapidly increasing in population, is so universally admitted, and so fully appreciated, that it is deemed altogether unnecessary to attempt any illustration, of the many, and deeply interesting considerations, which urge upon us the propriety of availing ourselves, of every practicable means, by which this most desirable purpose can be effectuated.

Whether we consider the subject as regards its social, commercial, or political relations, it is believed that all will agree, there is no other question, which can, at this time, have so strong a claim upon the close and earnest attention of the American people and Government.

Of the several artificial means of intercommunication between distant points, turnpike roads, canals and rail-ways; unquestionably have the advantage over all others which human ingenuity has suggested; each of these has its particular claims to a preference, according to the nature and extent of the communication proposed to be accommodated, or to local circumstances, and the surface of the country to be traversed.

When the traffic or communication is small, a turnpike road would, on account of the cheapness of its cost, naturally be adopted. when the country is level, and water abundant, as in Holland, a canal would afford all the necessary accommodation, if speed in transportation was not requisite; but when the country is mountainous, or even undulating—the traffic large, and a rapid transit desirable, a rail-road would afford advantages so much greater than either a turnpike road or canal, as to leave no doubt of its superiority, both as regards safety, speed, and economy.

The following reports and statements of experiments upon the Liverpool and Manchester, and other rail roads in England, will, at once satisfy every candid unprejudiced individual of the correctness of this opinion; and will afford an exhibit of the prodigious improvements which in the short space of three years have been realised in the construction of Rail Roads, and the application of moving power upon them in that country. At the same time it should be remarked, that experience, aided by the inventive genius of highly talented men, both in the United States and in Europe, is daily developing further discoveries and improvements, in this important system of intercommunication.

From the London Courier, November, 1826.

"About a fortnight since, a number of experiments with the locomotive engines, were performed at Killingworth, near Newcastle-upon-Tyne, by order of the Committee of the Liverpool and Manchester Rail-way.

On the 22nd ult. a superior engine, of eight horse power, being employed, the diameter of the wheels being four feet, five different trials of its power and speed were made. The weight moved, exclusive of the engine, was 48 tons, 15 cwt. The inclination of the road was 1 in 840—the greatest rise in any part 11 inches in 100 yards, or 1 in 327. The engine and load being moved in both directions along this inclined plane, the total result may be considered as upon a horizontal plane. The average velocity *was nearly seven miles an hour*, and the greatest speed nine and a half miles an hour. As this engine was not of the best construction for speed, no doubt can be entertained, that with proper engines, goods and merchandise may be conveyed with a very considerable increased velocity."

Extract from the letter of an American Gentleman in England, dated, Liverpool, 29th Sept. 1827, published in the Baltimore Gazette.

"Each Locomotive Engine conveys a train of 27 wagons, conveying 90 tons of coal, on the Leeds Rail-road.

"I next proceeded to the Hetton Rail Road. This extends from the Hetton Collieries over a series of *high hills*, to the river Wear, near Sunderland, a distance of several miles.

"From the uneven features of the country, the Hetton Road consists almost entirely of a series of *inclined planes*.

"*Here* is a practical and very striking illustration of the effect of this novel mode of transportation in a *hilly or mountainous* country. A sterile, broken region, hitherto nearly inaccessible, and entirely unproductive, suddenly emerges from obscurity, and becomes, by this ingenuous contrivance, a source of great private emolument, as well as public (and I may say *National*) utility. This is in part demonstrated by the immense increase of shipping at this port.

"Ascending one of the Rail Road Coaches, I returned to Darlington, and from thence to New Shelton, a distance of twenty miles. Here commenced the first Inclined plane, and here terminates the route of the Locomotive Engines. This hill is ascended by an Inclined plane of one mile and three quarters, in a straight line; on the summit there is a stationary Engine of sixty horse power, the descent westward, is also by an incline

of one mile and a half; the same Engine acts upon both these planes.

"Taking my station upon the last of a long line of wagons, the foremost of which, being previously attached to the rope, and the proper signal being given, I found myself in a moment hurried up the ascent with a surprising and unexpected velocity, which brought me in a few minutes, to the summit, whence I was conveyed down the western side with the same speed; so that this heavy train of wagons was transported over this formidable barrier, a distance of three miles and a quarter, in the space of a few minutes.

"The prompt, vigorous, and rapid style, in which this movement is performed, is eminently calculated to excite both surprise and delight, and affords a striking contrast to the tardy operations of a Canal similarly circumstanced.

"The engines are simple in their construction, neat and light, of five or six horse power, and each one generally takes a train of ten or twelve loaded wagons. The *conductor* executes the various manœuvres with such surprising facility, that one would almost imagine the beautiful machinery to be endowed with intelligence. The whole train is made to advance, to recede, to turn out, at pleasure; and when arrived at its destination, the engine immediately takes a position *in the rear of the line of wagons*, pushes them onward to the *Shutes*, where the coals are discharged, and finally taking them in its train, returns back upon the same route."

The experiments with Locomotive Engines, above enumerated, and those which will presently be submitted, were made with wagons *of the old construction*. Mr. Ross Winans, an American citizen, has, invented a Rail-way Car, which by the addition of anti-friction wheels, will enable a given, power acting upon a horizontal Rail Way to transport a weight perhaps twice as great as by the ordinary Rail-road wagons heretofore used.

Extract from the Liverpool Mercury of 17th July, 1829.

"Our readers may form a tolerable idea of the ease with which this (Winans') carriage is moved, by the fact, that on a dead level, a weight of *sixteen pounds*, drew it forward at the rate of about three miles in the hour, while it was laden with three tons of iron, which, including the weight of the carriage, amounted to *three tons fifteen hundred weight*. With fifteen ordinary sized persons standing and sitting in the wagon, two men by means of the winches, urged it forward at a rate exceeding thirteen miles in the hour; and we were told by a

gentleman who had a stop watch, that the maximum speed was fifteen miles."

Extract from the Liverpool Times.

"This invention (Winans) appears to possess considerable merit, and is likely to be of much practical utility.—It appears that, by manual power applied by winches, a passage between this place and Manchester, (34 miles) may be effected in about three hours, at about 6d. a head. This will be the actual cost of the power, but the proprietors of the road will probably charge 3s. 6d. or 4s. which will leave an immense revenue on the carriage of passengers only. It is intended to convey along the rail-road between this place and Manchester, not only bipeds, but animals of various kinds, and carriages have already been constructed for the accommodation of cattle and pigs! We, on Monday, saw a carriage constructed for the accommodation of the latter respectable class of quadrupeds, which certainly is a much handsomer and more commodious vehicle than those in which his Majesty's liege subjects were accustomed to travel fifty years ago."

Extract from the Liverpool Chronicle, 26th September.

"RAILWAY EXPERIMENTS.—On Wednesday, several gentlemen assembled on the level piece of railway between Edge-hill and the Wavertree road, to witness the trial of railway carriage wheels on Mr. Winan's principle. The carriage and wheels weighed

	0 tons.	11 cwt.	1 qr.	3lbs.
and was loaded with pig iron,	3	0	1	21
	<hr/>			
making a total of weight to be moved,	3	11	2	24

A contrivance for ascertaining the requisite power or weight to move the above was used, that had previously obtained the sanction of two eminent engineers. The carriage and weight were moved along the road at various speeds, and with 10lbs. 12lbs. 15lbs. 17lbs. and 19lbs. from which the following proportionate results were deduced.

1lb.	moved	334	and kept it moving	4½	miles per hour.
1lb.	"	470	"	3	"
1lb.	"	616	"	2½	"

When motion was first given by other power to the carriage, then

1lb.	with	617	kept it moving	4½	miles per hour.
1lb.	"	800	kept it moving.		

When 12lb. 12 oz. and upwards were used to bring the carriage and load forward, it invariably gained in speed.

On the whole, the results were highly satisfactory, and, from them it would appear, that a horse's work on the rail-road, at a slow speed, may be brought to approximate much nearer to his work on a canal, than perhaps had been generally imagined. One point seemed to be fully established, *that this principle has greater advantages under a quick speed than under a slow one.* for, when considerable speed was given at first, by other power, the speed was better kept up or increased by the respective weights, than when tried under a slow speed.

[From the above it will be seen, that rating the power of a horse at 120 lbs. the result will be equal to 33 tons drawn by a single horse at the speed of two and a half miles per hour.]

From the Liverpool Mercury, Oct. 9.

TRIAL OF THE LOCOMOTIVE CARRIAGES ON THE RAIL-WAY.

Our readers are aware, that a few months ago, a premium of £500 was offered by the Directors of the Liverpool and Manchester Railway Company, for a Locomotive carriage of the best construction, and combining in the highest degree the advantages of velocity and draught. On Tuesday last, the experiments to ascertain the merits of different carriages which have been entered for the prize, were commenced, and they have been since continued daily, in order to ascertain, satisfactorily, their different merits. The spot chosen for the experiments, was a portion of the railroad, near Rainhill, about ten miles from Liverpool, which is on a perfect level, and is therefore, admirably adapted for the purpose. The ground was crowded with spectators from Liverpool and the neighbourhood, to the number of 10,000 or 15,000. The following gentlemen were the umpires or judges; J. M. Rastrick, Esq. of Stourbridge; N. Wood, Esq. of Killingworth, and J. Kennedy, Esq. of Manchester. There were also several gentlemen from different parts of the kingdom, eminent for their scientific and mechanical knowledge, on the ground. The following is a description of the carriage:

- No. 1.—Messrs. Braithwaite and Erickson, of London. "The Novelty;" copper and blue; weight 2 tons. 15 cwt.
- 2.—Mr. Ackworth, of Darlington. "The Sans Pareil;" green, yellow, and black; weight 4 tons, 8 cwt. and 2 qr.
- 3.—Mr. Robert Stephenson, New Castle-upon-Tyne. "The Rocket;" yellow and black, white chimney, weight 4 tons, 2 cwt.
- 4.—Mr. Brandreth, of Liverpool. "The Cycloped," weight 3 tons, worked by 2 horses.

5.—Mr. Burstall, Edinburg. "The Perseverance;" red wheels; weight 2 tons, 17 cwt.

Of these, the four first were exhibited during the day; but Mr. Burstall's did not make its appearance, as it was unfortunately thrown off the wagon on which it was conveyed to the scene of action, and experienced some injury in the fall. The following account of the running on the first day, we take from that Courier of Wednesday:

"The Locomotive carriages attracted, of course, the attention of every individual on the ground. They ran up and down the road during the forenoon, more for amusement than experiment, surprising and even startling the unscientific beholders by the amazing velocity with which they moved along the rails. Mr. Robert Stephenson's carriage attracted the most attention during the early part of the afternoon. It ran without any weight being attached to it, at the rate of 24 miles in the hour, shooting past the spectators with amazing velocity, emitting very little smoke, but dropping red-hot cinders as it proceeded. Cars containing stones were then attached to it, weighing together with its own weight, upwards of 17 tons, preparatory to the trial of its speed being made. The precise distance between the point of starting, at or near the weighing shed to the point of returning, was $1\frac{3}{4}$ miles; but, in the adjudication of distances, we are given to understand, the judges allowed a furlong at each end for the acquirement and abatement of speed.—The observations we record, apply, however, to the whole distance. With a load of $12\frac{1}{2}$ tons gross, the Rocket travelled the above space of $1\frac{3}{4}$ miles, four times forward and backward, equal to fourteen miles, in the space of 75 minutes, exclusive of stoppages; but including the stoppages, the average rate was $10\frac{1}{2}$ miles per hour. But in the fifth course, the rate of speed, with a load, augmented by passengers until equal to 13 tons, was full 15 miles an hour.

"Mr. Ackworth, of Darlington, ran his carriage along the course during the day; but no trial of his speed with weights took place yesterday.

"The engine of Messrs. Braithwaite and Erickson, of London, was universally allowed to exhibit, in appearance and compactness, the *beau ideal* of a locomotive engine. Its performance, while exercising without a load, was most astonishing: passing over a space of $2\frac{3}{4}$ miles in seven minutes and a quarter, including a stoppage. With this delay its rate of speed was about 23 miles an hour. While running, the progress was upwards of 28 miles an hour. The velocity at which it moved, surprised and amazed every beholder. It seemed, indeed, to fly, present-

ing one of the most sublime spectacles of human ingenuity, and human daring the world ever beheld. It actually made one giddy to look at it, and filled thousands with lively fears for the safety of the individuals who were on it, and who seemed not to run along the earth, but to fly, as it were, on the wings of the wind."

The following are additional particulars:—We have been informed at the Railway Office, that the course was rather more than a mile and three-quarters each way, making a total distance each heat of about three miles and a half. Mr. Stephenson's carriage, the Rocket, with wagons and tender attached to it, weighing 12 tons 9 cwt., and the weight on the wheels of the engine being 4 tons 3 cwt., performed four heats in the following periods:

The 1st heat was performed in $13\frac{1}{2}$ minutes.

2d	"	"	$22\frac{1}{2}$	"
3d	"	"	$15\frac{1}{4}$	"
4th	"	"	$17\frac{1}{4}$	"

$62\frac{1}{2}$ minutes.

Being a distance of fourteen miles. The Rocket performed one heat, without any weights being attached to it, $8\frac{1}{2}$ minutes, being at the rate of $24\frac{1}{2}$ miles in the hour.

EXPERIMENTS ON WEDNESDAY.—We have just heard that there was an experiment made on Wednesday, with the carriage of Messrs. Braithwaite and Erickson, preparatory to the grand trial which is to be made on Saturday. The carriage is said to have travelled at the rate of 25 miles in the hour, with three times its own weight. In consequence of the bursting of the bellows of one of the engines, the commencement of the contest was postponed to yesterday.

Further experiments on the Rail Road.

THURSDAY.—The powers of Mr. Stephenson's carriage, the Rocket, were this day put to the test in the performance of a journey of seventy miles, with loaded wagons attached to it. This, we are informed, was done at the average rate of eleven miles in the hour, including stoppages, and the time lost after stopping to return, before the recovery of the general speed. On one occasion the distance of thirteen miles was performed within the hour. We have been favoured by Messrs. Braithwaite and Erickson with the following paragraph:

Trial of the Locomotive Engine.—In consequence of the judges having this day ordered a new set of conditions, or "or-

deal which each locomotive engine shall undergo in contending for the premium of £500 at Rainhill," Messrs. Braithwaite and Erickson, have, with the approbation of the judges, deferred the further exhibition of their engine, "the Novelty," till tomorrow (Saturday) the 10th, on which day, at 11 it will start at Rainhill, to go 70 miles with its allotted load, in less time than any other engine.

The following regulations have been made with respect to the course:



A line of road, A. B. is fixed upon for the experiment; the space between *c* and *d* being 3 miles. This distance will be run over ten times, at full speed, each carriage carrying three times its own weight. The space between A. and *c*, at one end, and B. and *d* at the other is allowed for the carriage to slacken speed, to turn, and to regain its maximum state.

This will be a very decisive and satisfactory test of the respective capabilities of the carriages, and the winner will very amply merit the five hundred pounds, which will be the reward of his ingenuity.

The weight of the carriage of Messrs. Braithwaite and Erickson, is said, in the newspapers, to be 3 tons 15 cwt. In the Directors' card, however, which we presume to be more correct, it is stated to be only 2 tons 15 cwt. Messrs. Braithwaite and Erickson have pledged themselves to produce another carriage, which shall transport fifteen persons in one hour from Liverpool to Manchester. [the distance 34 miles.]

FURTHER AND MORE INTERESTING EXPERIMENTS.

From the Liverpool Chronicle of Oct. 17th.

Saturday—Fifth Day.—It has been arranged, that the London engine was to start this morning; and accordingly, at the appointed hour, the engine was weighed, and the load assigned to it by the judges. The steam was got up in 54 minutes from the time of lighting the fire. The engine went one trip by way of rehearsal, when the accidental explosion of a small copper tube, caused a delay until it could be repaired; by the time matters were adjusted, it was considered too late to commence the running with a view to a decision. Between the occurrence and the repair of this little mishap, Mr. Stephenson's locomotive engine was run twice down the course and back, making in all seven miles. The boilers were filled, the steam got up, and all load was taken off from behind, including even the tender-car-

riage with the water tank. Thus stripped for the race, the Rocket was started off, and performed the seven miles in the incredibly short space of fourteen minutes, being at the rate of thirty miles an hour. This was a highly interesting exhibition, and gave universal satisfaction.

When the Rocket had run, the Novelty started in order to make a fair experiment of her power, her load being attached, Mr. Vignoles, the engineer, who rode on the Novelty, and timed it, has given the following record of the weights and performances of that engine:

	<i>Tons</i>	<i>Cwt.</i>	<i>Qrs.</i>	<i>Lbs.</i>
Weight of the Engine,	2	15		
Load assigned by the judges, water, coke, and persons on the Engine.	7	11	1	9
	<hr/>	<hr/>	<hr/>	<hr/>
Tons	10	6	1	9

The Engine went off from the starting post at the rate of 12 miles per hour, and her velocity rapidly increased during the whole trip.

The mile between the quarter post and the Judges' tents, was run in 2 minutes 54 seconds, while the last half mile was run in 85 seconds, being at the rate of 21 1-6 miles per hour.

The whole time between the tents of the Judges, at each end, being exactly 1 1/2 miles, was performed in 4 minutes and 30 seconds, being at the rate of 17 1/2 miles per hour.

It should be remembered, that this experiment was made on a dead level, and that the rails could not be said to be wet, although, from the appearance of the morning, they might be called damp.

On returning, the speed was slackened, and it will be perceived, that the rate was nearly uniform. The whole distance of 1 1/2 mile, between the tents of the judges, was performed in five minutes and fifty four seconds, being at the rate of nearly 15 1/4 miles an hour. The first mile was precisely at the rate of 15 miles an hour, and the last quarter was done in 56 seconds, being upwards of 16 miles an hour.

There is no doubt, that on a continued forward journey, the Novelty would have freely travelled at the rate of twenty miles per hour. The average rate of her two trips was very nearly 16 1/2 miles an hour; always loaded.

The Novelty, after this highly interesting experiment, ran down to the grand stand, with empty wagons, and then a large assemblage of ladies and gentlemen mounted, among whom we noticed Dr. Traill and his family. The doctor timed the speed of the Novelty while running the full course, and it appears to

have averaged twenty-two miles an hour, with forty-five passengers, and at one period carried the same passengers at the inconceivable velocity of thirty two miles an hour. The Novelty ran over the course twice, the experiments ceased, and the company hastened back to town, to await the races of this week, with an impatience only to be conceived by those who saw with their own eyes, what locomotive engines can do.

We understand that the Novelty is the first locomotive engine Messrs. Braithwaite and Erickson ever constructed, and it was four months after the appearance of the advertisement offering the premium that they first thought of applying the principle of their patent boiler to generate locomotion on a railway. This having been determined on, it naturally required some time to digest and dispose the application of the principle, to study the form and arrangement of the engine, and to reduce all these to working drawings. It was only on the 1st of August that the Novelty was put into hand; and on the 29th of September, it arrived by the canal at Liverpool! It was never even tried until two days before the first day's contest.

Monday.—Sixth Day.—There was no note of preparation sounded this morning, although it was considered that some novelty might be witnessed during the day, the result proved it a very *dies non*.

Tuesday.—Seventh Day.—The Judges were at their stations early this morning, and shortly afterwards Mr. Ackworth's engine was announced as ready for the race, it having been previously weighed and the regular load assigned. The first printed cards having stated the weight of the "Sans Pariel" to be four tons 8 cwt. 2 qrs. the load assigned to it, according to the conditions, would be 13 tons, 5 cwt. 2 qrs., making in all 17 tons 13 cwt. for the total of the engine and load. Soon after ten, the "Sans Pariel" started to do her assigned performance of seventy miles; and for two hours this engine performed with great speed and regularity, averaging full fourteen miles an hour, for a distance of upwards of twenty-five miles, while dragging that enormous load. One of the pumps which supply the boiler from the tender was out of order, which caused a cessation of the race, but this not being considered as tending to effect the velocity of the engine, and the "Sans Pariel" exhibited enough during the day to show that her powers are of a superior order indeed. Mr. Stephenson's engine was also on the ground this day, and excited, if possible, increased interest. The numbers present, notwithstanding the unfavourable state of the weather, were considerable, and appeared to be highly gratified with the different exhibitions.

Wednesday.—Eighth Day.—We may consider the trial of the Locomotive Engines virtually at an end. In consequence of the number of petty accidents which had occurred to the London engine, "The Novelty," the ingenious inventors, Messrs. Braithwaite & Erickson, (rather unadvisedly as we consider) took their engine to pieces after the performance of Saturday, and they only had the joints of the boiler pipe closed this morning. Every engineer knows the effect of a high pressure upon a green joint, but as the Novelty had been entered for this day's contest, the proprietor, determined upon starting. Accordingly, at one o'clock the engine set off, and performed about seven miles in a manner highly satisfactory, going at one time at the rate of twenty-four miles an hour, with its accustomed load, when the green joint of the boiler pipe gave way, as might have actually been expected, and the engine was obliged to stop. It is much to be regretted, that the Novelty had not been built in time to have the same opportunity of exercising that Mr. Stephenson's engine had, or that there is not in London, or its vicinity, any railway where experiments with it could have been tried. It will evidently require several weeks to perfect the working of the machine and the proper fitting of the joints, and under this impression, Messrs. Braithwaite and Erickson have acted wisely in withdrawing, as they have done, from the contest.

In the early part of the day, Mr. Stephenson's engine ascended the Rainhill inclined plane several times with heavy loads of passengers, and did this at a rate of twelve miles an hour; now, considering that the rate of ascent is 1 in 96, or upwards of a third of an inch in a yard, we consider the erection of fixed engines on that and the other inclined plane at Sutton, as quite out of the question.

The course is thus left clear for Mr. Stephenson, and we congratulate him with much sincerity on the probability of his being about to receive the reward of £500. This is due to him for the perfection to which he has brought the old-fashioned Locomotive engine; but the grand prize of public opinion is the one which has been gained by Messrs. Braithwaite and Erickson for their decided improvement in the arrangement, the safety, simplicity, and the smoothness and steadiness of a Locomotive Engine, and however imperfect the present works of the machine may be, it is beyond a doubt, and we believe we speak the opinion of nine-tenths of the engineers and scientific men now in Liverpool, that it is the principle and arrangement of this London engine which will be followed in the construction of all future locomotives. The powerful in-

introduction of a blast bellows, the position of the water tank below the furnaces of the carriages, by which means the centre of gravity is brought below the line of central motion, the beautiful mechanism of the connecting movement of the wheels, the absolute absence of all smell, smoke, noise, vibration, or unpleasant feeling of any kind, the elegance of the machinery, in short the *taut ensemble* proclaim the perfection of the principle, and we deeply regret that the want of sufficient time to practice the mere mechanical motion of their engine, has caused Messrs. Braithwaite and Erickson to withdraw, their motives for which, we hope will be properly appreciated by the public, and by the railway directors, inasmuch as we believe it has been only to devote their whole time and talent to the perfection of their machine.

In awarding the principal prize, we cannot doubt both the inclination and the intention of the directors to purchase the engines which have been exhibited, and to reward with minor prizes the unsuccessful but ingenious competitors.

The opinion which we have heard almost universally expressed by scientific and practical men, who are best competent to judge, is, that the principle of the "Novelty" is the most complete. We have heard many suggestions as to the best mode of correcting the imperfections of the mere working parts of the machine, but it would ill become us, by repeating them, to pretend to dictate to persons who must know so much better than any others how this may be done, as the ingenious inventors.

The Editor of the Liverpool Mechanics' Magazine, who rode on the Novelty, describes his ride thus:

"A carriage with seats for the accommodation of passengers, being substituted for the loaded wagons attached to "The Novelty," about forty-five ladies and gentlemen ascended to enjoy the excursion by steam. We can say, for ourselves, that we never enjoyed any thing in the way of travelling more. We flew along at the rate of a mile and a half in three minutes, and though the velocity was such, that we could scarcely distinguish objects as we passed them, *the motion was so steady and equable, that we could manage not only to read but write.*"

The editor of the Leeds Mercury, who was present, says:

"We had the pleasure to travel on a level at the rate of twenty-eight miles an hour, with as little appearance of danger and even of undue speed, as is felt in a stage coach travelling on the highway at the ordinary speed. The motion indeed of the carriage was so slight, that the passengers could read with perfect ease at the period of its utmost velocity, and, if the springs

on which the carriage for the passengers was mounted had been in perfect order, we think it would not have been very difficult to write."

FURTHER EXPERIMENTS ON THE RAIL WAY.

After the lengthened accounts which have appeared in this and other papers of the experiments which have been made on the Railway, we should not have ventured to call the attention of our readers again to the subject, if we were not convinced that the first experiments that were tried afforded *no idea of the power actually possessed by locomotive engines*. By the original conditions issued by the directors, it was required that the carriages should draw three times their own weight, and proceed at the rate of ten miles an hour, and this was at first thought to be a considerable task. Subsequent experiments have, however, proved that this is nothing in comparison with what the carriages really can perform. We stated last week that the prize engine, the *Rocket*, had drawn 20 tons, at the rate of from 13 to 20 miles per hour, and since then we have seen it draw the still more astonishing load of 42 tons; or ten times its own weight, at the rate of 15 miles an hour, which is by far the greatest task that has ever been performed by a locomotive carriage. This feat it performed on Thursday last. At the commencement of the experiments, a load of 33 tons was attached to the carriage, which it drew along for several miles at the rate of $13\frac{1}{2}$ miles an hour. An additional load was then put on, which raised it to $37\frac{1}{2}$ tons, and with this it proceeded at the rate of $13\frac{3}{4}$ miles an hour, its speed constantly increasing as it got into practice. The enormous load of 42 tons was then put on, and with this it proceeded at the average rate of 14 miles an hour! Another class of experiments was afterwards tried in order to ascertain with what load, and at what rate it would ascend the inclined plane at Huyton, when it was found that with 11 tons it travelled the mile and a half in 5 minutes and 35 seconds, or 16 miles an hour, and with 16 tons in 7 minutes and 10 seconds, or $12\frac{1}{2}$ miles an hour. These performances far exceed the warmest anticipations of the friends of locomotive carriages, and afford additional and incontestible evidence of their superiority to all the modes of conveyance which at present exist.—The Directors have ordered four locomotive engines on Mr. Booth's principle of boiler, that of the *Rocket*, to be built by Messrs. Robert Stephenson and Co. of Newcastle.—*Liverpool Times*.

The Editor of the London Mechanics' Magazine, remarking upon the recent trial of Locomotive Engines at Liverpool, observes:

"But suppose we go a step further, and estimate what the effects will be of extending this system of communication over the whole kingdom; what mind is there so comprehensive as to embrace all the important consequences to which it will lead? We think we shall not go far in saying, *that it will produce an entire change in the face of British Society*. The effect will be much the same as if the workshop of the manufacturer were brought along side the quarry, where he obtains his raw material, and whence he sends it forth again in a manufactured shape, to the most distant parts of the world: or as if the collieries, iron mines, and potters of the heart of England were scattered along its shores. Peculiar local advantages will figure less than they have done in our manufacturing and commercial history, since whatever one place produces, can be as quickly and cheaply transported to another; and instead of our manufactures continuing concentrated in two or three large towns—to the great injury of the moral and physical condition of those employed in them,—we may expect to see them spreading gradually over the kingdom.

Living in the country, will no longer be a term synonymous with every sort of inconvenience; and it will come to be a mere matter of choice, whether a man of business lives close by his counting house, or thirty miles from it. The rents of lands and houses will not be raised by the change, but they will be equalized; they will be reduced in town and raised in the country. In proportion, too, as the intercourse of men with each other, and the interchange of commodities between them is thus facilitated, the greater will be the cheapness of every thing; the more our manufacturers will have it in their power to bear up against that foreign competition by which they are so much endangered. The oftener (to use the common phrase) the penny is turned, the greater the profit; and the quicker the trader's return, the smaller capital he requires in business. In fine, we may say of railways in general, as a worthy gentleman is said to have observed of the Stockton and Darlington line, and with ten times greater probability of seeing our prophecy realized. **"LET THE COUNTRY BUT MAKE THE RAIL-ROADS, AND THE RAIL-ROADS WILL MAKE THE COUNTRY."**

TO THE SENATE

AND

HOUSE OF REPRESENTATIVES

Of the United States, in Congress assembled.

The Memorial of the President and Directors of the Baltimore and Ohio Rail Road Company,

RESPECTFULLY SHEWETH,

That your Memorialists are engaged in the construction of a Rail Road, with at least two sets of Tracks, from the City of Baltimore to the Ohio River, upon which they have been actively employed a little more than one year, and have nearly completed the graduation and masonry, for about twenty-six miles, including, as your Memorialists confidently believe, the most expensive and difficult part of the entire line. Upon about three miles of this, a Rail Way has been laid down.

The necessary acts of Incorporation have been obtained from the States of Maryland, Pennsylvania and Virginia, vesting your Memorialists with most ample powers to conduct the Road through those States, and affording to them every requisite protection and security.

Stock to the amount of three Millions of Dollars has been subscribed by individuals, and to the amount of one Million of Dollars by the State of Maryland and City of Baltimore, constituting a Capital of Four Millions of Dollars, upon which 15 per cent., or 600,000 has been received: the Instalments being all paid, upon every share of Stock belonging either to the public, or individual Stockholders.

The entire district between the City of Baltimore and the Ohio River, has been examined, and it has been most satisfactorily ascertained, that the intermediate country affords such great facilities for the construction of the proposed Road, as to render its completion not only certainly practicable, but far less difficult than was at first supposed; and an actual location of its eastern section has been made, extending from Baltimore to the Valley of the Potomac, a distance of about 66 miles. Along this line a route for the Road has been secured, which, with the

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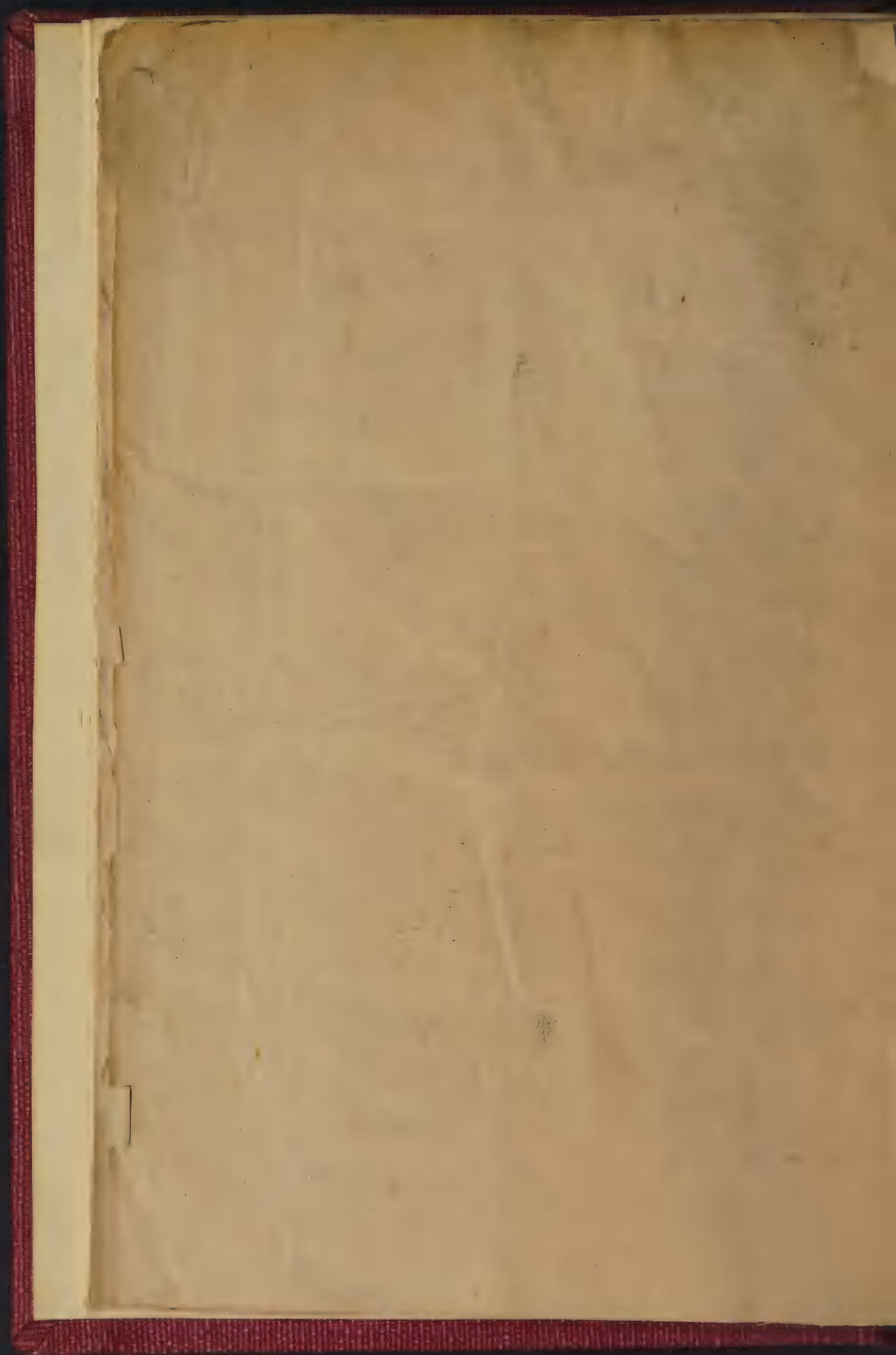
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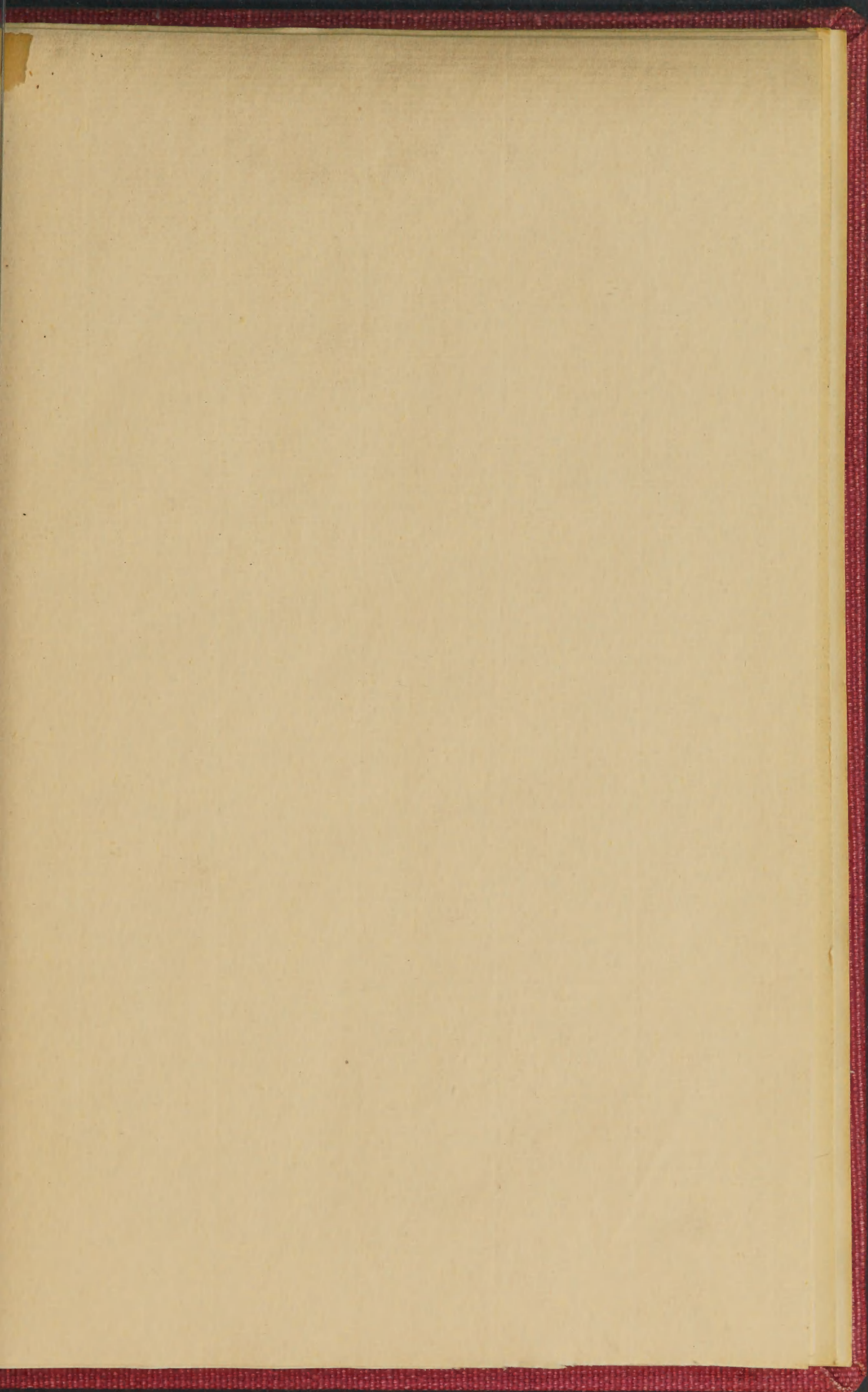
exception of a slight elevation between the Monocacy and Potomac rivers, has only a single summit, and across this summit a track has been gained of so easy access, as to occasion but little difficulty, or increase of expense to the transportation. By pursuing the Valley of the Potomac, the Road may be continued, if desired, without one additional summit to the Eastern base of the Alleghany mountain, and would then exhibit a Rail Way of about 180 miles, with but one summit requiring stationary power, a result which it is believed, has not been paralleled either in this country or in Europe. From the Eastern base of this mountain, the Road can be conducted by a series of Inclined Planes, and the aid of stationary engines, over that ridge to its Western Side, without any diminution in the speed of travelling, and thence it may be carried by a regular graduation, adapted to locomotive power, to the Ohio River.

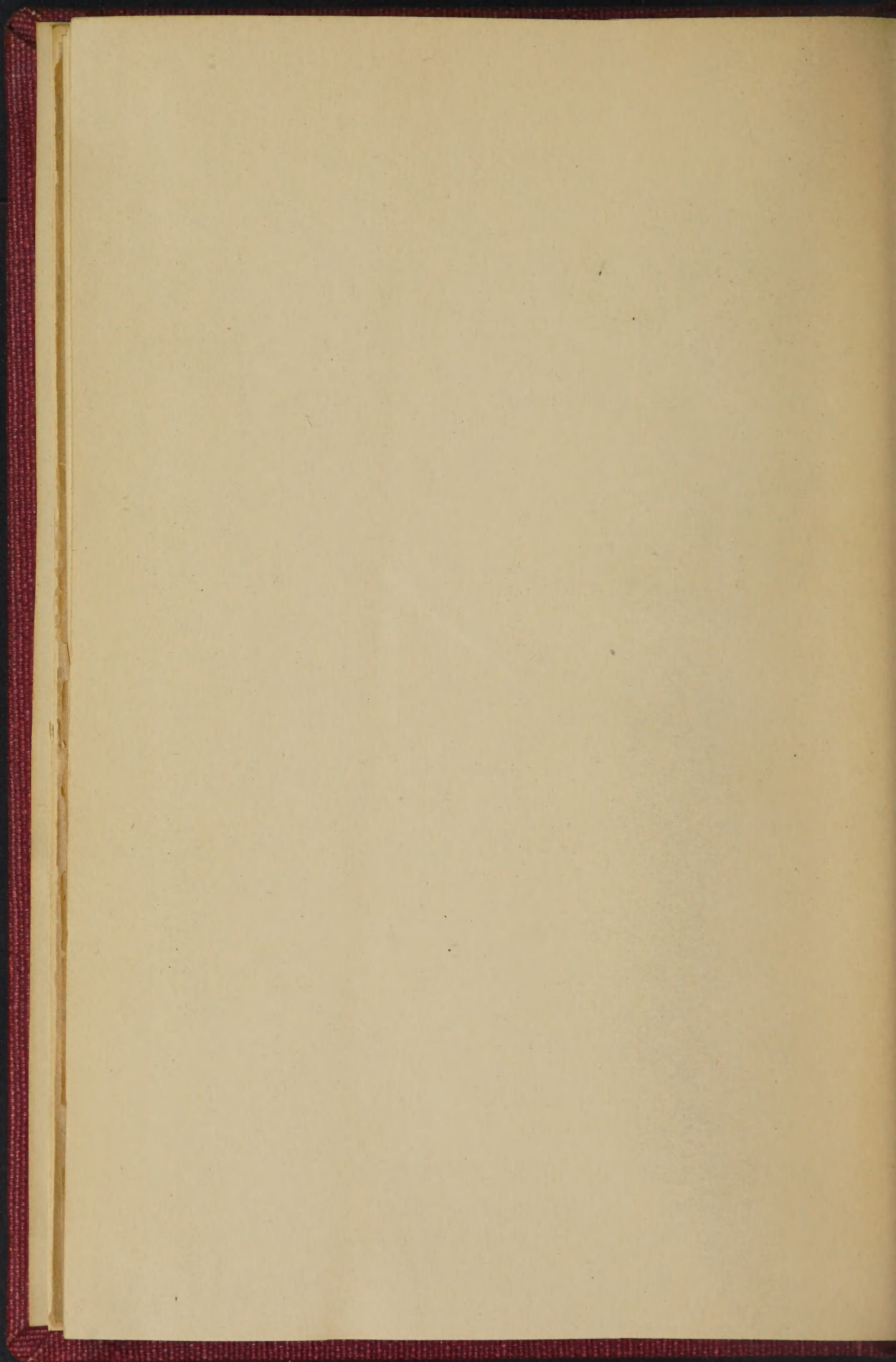
The result of the late improvements in the construction of Locomotive Engines in Europe, and in the application of Steam Power to them, fully warrant your Memorialists in asserting, that upon a well constructed Rail Road, the Mail might, with regularity and certainty, be conveyed from the seat of the general Government to the State of Ohio, in thirty-six hours, or even in less time, should it be desirable. Passengers could also be conveyed in the same time at one-third the expense now incurred, and produce of all kinds at a proportionate reduction of cost.

At the time your Memorialists embarked in this enterprise, they did not hesitate to believe, that so enlightened a body as the Congress of the United States, would fully appreciate the vast importance of the undertaking, whether considered in reference to its social, its commercial or its political influence upon our country, and they have always looked with confidence to the aid of the general government in carrying it into operation. Believing, as your Memorialists do, that every section of our country has a deep and vital interest in this great work, and that the countenance and support of the National Legislature, would essentially promote its early and successful accomplishment, they respectfully ask the attention of Congress to the subject, and confidently hope that a subscription, on the part of the United States, to the Stock Company, will be authorised to such extent as in their wisdom may be deemed for the interest of the Nation.

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